

**CERTIFICATE OF FACSIMILE TRANSMISSION**

I hereby certify that this paper is being facsimile transmitted to the U.S.  
Patent and Trademark Office on September 22, 2003.

Toni Bosch  
Name printed

Toni Bosch  
Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Alvin D. Compaan et al. Group Art Unit 2818

Serial No.: 09/815,958

Examiner: Dung Le

Filed: March 23, 2001

Attorney Docket No.: 1-22335

For: SEMICONDUCTOR HAVING GROUP II - GROUP VI  
COMPOUNDS DOPED WITH NITROGEN

Mail Stop Box Non-Fee Amendments  
Commissioner for Patents, P.O. Box 1450  
Alexandria, VA 22313-1450

RECEIVED  
SEP 30 2003  
TECHNOLOGY CENTER 2800

**AFFIDAVIT OF VICTOR KARPOV UNDER 37 CFR 1.132**

Honorable Sir:

I am Victor Karpov, Ph.D., currently holding the position of full professor in the Department of Physics and Astronomy at the University of Toledo in Toledo, Ohio.

My educational background includes Ph. D. (Physics - 1979) and Doctor of Science degrees (Physics - 1986) from the Academy of Science of Russia.

Since receiving my doctoral degree I have taught physics both at the Technical State University of St. Petersburg, University of Chicago, and at the University of Toledo. In both positions my work included extensive research and teaching in the field of semiconductors and related technology in solar cells.

I am widely published, having published approximately 90 articles, and made more than 50 presentations before scientific gatherings, including numerous national labs and universities. I have also worked for industrial semiconductor companies.

I have read U.S. Patent No. 4,064,522 to Shaw et al. (hereinafter, "Shaw"), entitled "High Efficiency Selenium Heterojunction Solar Cells". In column 4 of the patent, Shaw teaches that cadmium metal can be treated with reactive sputtering in a nitrogen/oxygen atmosphere to produce cadmium selenide and cadmium oxide layers,

PATENT

forming a heterojunction. Shaw refers to those layers as N-type layers and N+ type layers.

Based on my extensive experience in the physics of semiconductors, the terminology N-type layers and N+ type layers in Shaw would undoubtedly be interpreted by those knowledgeable in the field of semiconductors to mean negative doped layers, being of the type that could supply the electrons, in contrast with p-type layers which would accept the electrons. It is very highly unlikely that a person skilled in the art of semiconductors would view the disclosure of the Shaw patent to mean that semiconductor layers having nitrogen doping were created.

Since Shaw teaches the use of reactive sputtering in the presence of a nitrogen/oxygen atmosphere, there is a possibility that a minute amount of nitrogen doping of the semiconductor layers could occur. However, it would be generally recognized by those skilled in the art of semiconductors that such nitrogen doping would create predominantly n-type layers, and would not make p-type layers.

  
Victor Karpov

Sworn and subscribed before me  
this 19<sup>th</sup> day of September, 2003.

  
Notary Public

My commission expires: MARGARET E. DELL  
Notary Public, State of Ohio  
My Commission Expires Oct. 15, 2007